

**Authors:** Boulanger, J.-P. (1,\*), P. Delecluse (2), L. Fu (1) and C. Perigaud (1)

\*E-mail: [jpb@pacific.jpl.nasa.gov](mailto:jpb@pacific.jpl.nasa.gov)

(1) Jet propulsion Laboratory  
Mail stop: **300-323**  
**4800 Oak** Grove Drive  
Pasadena, CA 91106, USA

(2) **LODYC**  
UMR CNRS/ORSTOMAJPMC  
4, Place **Jussieu**  
75252 Paris, Cedex 05, France

Long equatorial wave reflection.

Comparison of TOPEX/POSEIDON data and an OGCM simulation.

The accuracy of TOPEX/POSEIDON sea-level data gives now the opportunity to investigate some theoretical mechanisms suggested to be involved in El Niño/Southern Oscillation phenomenon. In particular, we are interested in testing the delayed action oscillator scenario using TOPEX/POSEIDON data. Thus, we first project sea-level data onto long equatorial Kelvin and first Rossby waves evidencing propagation and potential reflection at both eastern and western boundaries of the equatorial Pacific basin. Then, we compare our results to a single baroclinic mode simple wave model forced by ERS-1 winds. Long equatorial wave reflection at both boundaries are clearly shown, and their contribution to the central Pacific sea-level signal is estimated. However, large discrepancies between our simple wind-forced model and TOPEX/POSEIDON derived wave coefficients appear near the boundaries. To investigate them, we studied an OGCM simulation of the 1985-1994 TOGA period using the same techniques applied to data. Thus, we project simulated dynamic height (relative to 1000 dbar) onto long equatorial waves, and we compare projected coefficients to coefficients calculated by the simple wave model forced here by the wind stress used for the OGCM simulation. Discrepancies are also observed between both coefficients near the boundaries. Finally, we conclude on long equatorial wave existence in TOPEX/POSEIDON data and in our simulation and on the role of reflected waves on sea-level variability in the central Pacific.